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(12) Utility Model

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Tube
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T U B E

This innovation refers to a tube for a device for transporting an object with the aid of air pressure variation, which tube has one end for applying the air pressure variation to the object and another end for connecting with a means for producing air pressure variation, where one end can be displaced with respect to the other end.

Such a device can be utilized, for example, in a removing device for removing the cover from a baking mold or a setting device for setting a cover onto a baking mold. Such devices are used in automatic manufacturing lines for the production of bread. Flexible tubings have been used in such devices so far, which can be bent not only in all directions, but also have an elongation to some extent. However, practice showed that when such a device is used many times, cracks may be produced in such a tubing, as a result of which the device no longer functions properly. The tubing must then be replaced.

The goal of the innovation which is now presented is to create a tube with a longer lifetime as a result of which the replacement of a tube needs to be carried out less frequently.

For this purpose, a tube of the type described in the first paragraph is characterized by the fact that the tube consists of two rigid partial tubes which can be moved telescopically relative to one another, coupled in an airtight manner, and that a part with a spherical outside surface is arranged at the two ends of the tube at its outside periphery. As a result of the fact that each part has a spherical surface at the ends of the tube, in each case a partial ball and socket joint is formed as a result of which one end can be displaced with respect to the other end in all directions. As a result of the fact that the partial tubes can be moved telescopically relative to one another, the distance between the two ends of the tube can be adjusted. In this way, no undesirable deformations of the tube occur, which could lead to damage of the tube, and the functioning of the device is maintained.

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The partial tubes are preferably coupled to one another in an airtight manner with the aid of seals. In addition, the two ends can be coupled to other parts of the device with the aid of seals.

An embodiment of the improved tube for a device for transporting an object with the aid of air-pressure variation is described with the aid of a single figure.

The tube 1 shown in the figure consists of two rigid partial tubes 2 and 3 which can be moved relative to one another telescopically. The partial tubes 2 and 3 are coupled to one another in an airtight manner, for example, with the aid of seals 19.

One end 4 of tube 1 is connected with a part 5 of the device for transporting an object, and this part 5 grabs the object to be transported through an opening 6 or through several openings. The other end 7 of tube 1 is connected with the aid of coupling tubing 8 to a means for producing air-pressure variation (not shown).

At the outside periphery of one end 4 a part 9 is applied with a spherical outside surface 10, and this part 9 is coupled in an airtight manner to part 5. This airtight coupling takes place preferably with the aid of seals 11 and 12, which are arranged either in recesses in part 5 or in recesses in part 9.

At the outside periphery of the other end 5, a part 13 with a spherical outside surface 14 is arranged, and this part 13 is coupled in an airtight manner to coupling tube 8. This airtight coupling is achieved preferably with the aid of seals 15 and 16, which are arranged either in recesses in part 13 or in the coupling tubing 8.

Parts 9 and 13 are preferably made of a synthetic polymer or from another hard plastic. The partial tubes 2 and 3 are preferably produced from a synthetic polymer. However, these parts 9 and 13 and the partial tubes 2 and 3 can also be made of light alloy or of other suitable materials.

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Due to the ball and socket joint formed by spherical surfaces 10 and 14, with pivoting points 17 and 18, respectively, one end 4 can be displaced in all directions with respect to the other end 7, so that the mutual distance between ends 4 and 7 can be adjusted by relative shift of partial tubes 2 and 3.

Now the functioning of the device for transporting an object with the new tube will be described.

The reduced pressure, which is produced by the means for producing air pressure variation is applied through coupling tube 8 and partial tubes 2 and 3 to the space in part 5. When part 5 is applied onto an object, so that the object is brought in contact with opening 6 with the reduced pressure, the object is then attracted to part 5. Then the object can be displaced, where the means for displacement are analogous to those which are used in a known device with the tubing. When the object is located in the desired place, the air pressure is increased until the object separates from part 5.

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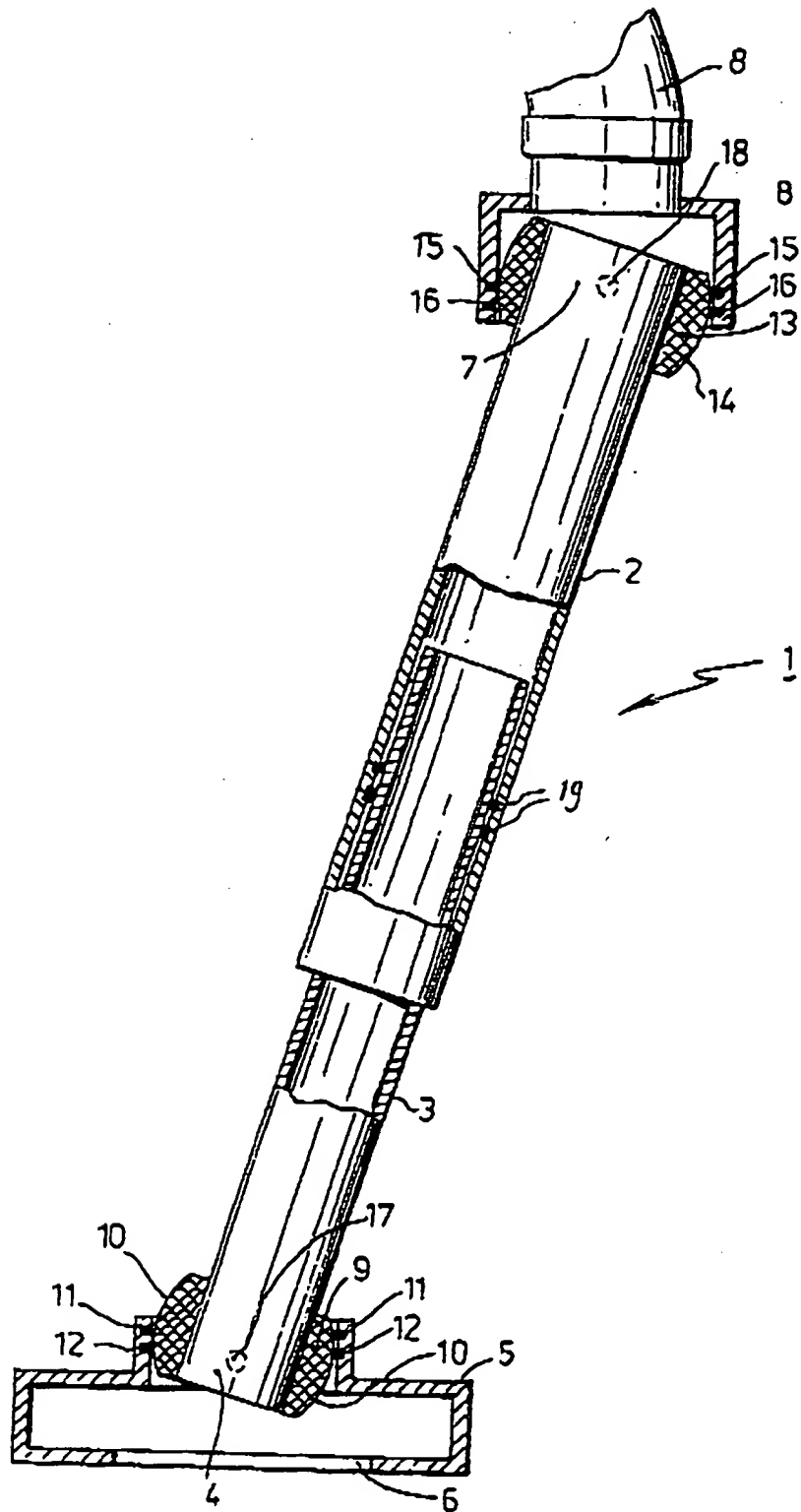
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PATENT CLAIMS

1. Tube for a device for transporting an object with the aid of air-pressure variation, which tube has one end for applying the air pressure variation to the object and another end for connecting with a means for producing the air pressure variation, where one end is displaceable with respect to the other end, **characterized by the fact that the tube (1) consists of two rigid partial tubes (2, 3), which can be moved with respect to one another telescopically, that the partial tubes are coupled to one another in an airtight manner and that a part (9, 13) with a spherical outside surface (10, 14) is arranged at both ends (4, 7) of the tube (1) at its outer periphery.**
2. Tube according to Claim 1, **characterized by the fact that one end (4) can be coupled in an airtight manner to a part (5) of the device, which attaches to the object.**
3. Tube according to Claim 1 or 2, **characterized by the fact that the other end (7) can be coupled in an airtight manner to the means for producing the air-pressure variation.**
4. Tube according to Claim 1, 2 or 3, **characterized by the fact that the airtight coupling is achieved with the aid of seals.**
5. Tube according to one of the previous claims, **characterized by the fact that each part (9, 13) with a spherical outside surface (10, 14) is made of synthetic polymer.**

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